



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of

DIETRICH et al.

Atty. Ref.: 3691-661

Serial No. 10/797,580

TC/A.U.: 1771

Filed: March 11, 2004

Examiner: Piziali, Andrew T.

For: COATED ARTICLE WITH LOW-E COATING INCLUDING IR  
REFLECTING LAYER(S) AND CORRESPONDING METHOD

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February 28, 2007

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**APPEAL BRIEF**

Sir:

Applicant hereby appeals to the Board of Patent Appeals and Interferences from  
the last decision of the Examiner.

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**(I) REAL PARTY IN INTEREST**

The real party in interest is Guardian Industries Corp., a corporation of the country of the United States. Co-assignee C.R.V.C., having a place of business in Luxembourg, is a wholly owned subsidiary of Guardian Industries Corp.

**(II) RELATED APPEALS AND INTERFERENCES**

The appellant, the undersigned, and the assignee are not aware of any related appeals, interferences, or judicial proceedings (past or present), which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

**(III) STATUS OF CLAIMS**

Claims 1-2, 4-8, 11-23, 26-27, 30-33 are pending and have been rejected. These claims are on appeal herein. No claims have been substantively allowed.

**(IV) STATUS OF AMENDMENTS**

No amendments have been filed since the date of the Final Rejection.

(V) **SUMMARY OF CLAIMED SUBJECT MATTER**

This section is for purposes of example only and without limitation.

*Claim 1*

The invention of the claim 1 relates to a heat treated coated article (e.g., ¶ 20).

The coating of the heat treated coated article comprises a first dielectric layer (e.g., see 3 and/or 7 in Fig. 1; ¶¶ 21, 23, 29); a first infrared (IR) reflecting layer comprising silver located over at least the first dielectric layer (e.g., see 9 in Fig. 1; ¶¶ 21, 26); a first layer comprising zinc oxide located over at least the first IR reflecting layer and the first dielectric layer (e.g., see 17 in Fig. 1; ¶¶ 21, 29); a second IR reflecting layer comprising silver located over and contacting the first layer comprising zinc oxide (e.g., see 19 in Fig. 1; ¶¶ 21, 26); a layer consisting essentially of an oxide of NiCr located over and contacting the second IR reflecting layer (e.g., see 21 in Fig. 1; ¶¶ 17, 18, 21, 27); a second layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of NiCr (e.g., see 22 in Fig. 1; ¶¶ 17, 18, 21, 29); another dielectric layer located over at least the second layer comprising zinc oxide in the heat treated coated article (e.g., see 23 and/or 25 in Fig. 1; ¶¶ 21).

The instant specification explains that the use of a layer comprising zinc oxide located over and contacting the oxide of NiCr (which is over and contacting an IR reflecting layer) unexpectedly and surprisingly results in higher visible transmission, improved thermal stability upon heat treatment, lower sheet resistance, and lower emissivity. E.g., see paragraphs [0009], [0010], [0018], [0030], [0031] and [0046] of the instant specification. In order to stress these unexpected results, claim 1 further requires that when measured monolithically following heat treatment the coated article has a

visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E_n$ ) of less than or equal to about 0.04 (e.g., see ¶¶ 17-19, 30, 36, 44).

*Claim 15*

The invention of the claim 15 relates to a thermally tempered coated article (e.g., ¶ 20). The tempered coated article comprises a first dielectric layer (e.g., see 3 and/or 7 in Fig. 1; ¶¶ 21, 23, 29); a first infrared (IR) reflecting layer comprising silver located over at least the first dielectric layer (e.g., see 9 in Fig. 1; ¶¶ 21, 26); a second dielectric layer located over at least the first IR reflecting layer (e.g., see 13, 14 and/or 17 in Fig. 1; ¶¶ 21, 29); a second IR reflecting layer comprising silver (e.g., see 19 in Fig. 1; ¶¶ 21, 26); a layer consisting essentially of an oxide of Ni and/or Cr located over and contacting the second IR reflecting layer (e.g., see 21 in Fig. 1; ¶¶ 17, 18, 21, 27); a layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of Ni and/or Cr (e.g., see 22 in Fig. 1; ¶¶ 17, 18, 21, 29); another dielectric layer located over at least the layer comprising zinc oxide (e.g., see 23 and/or 25 in Fig. 1; ¶¶ 21). The instant specification explains that the use of a layer comprising zinc oxide located over and contacting the oxide of Ni and/or Cr (which is over and contacting an IR reflecting layer) unexpectedly and surprisingly results in higher visible transmission, improved thermal stability upon heat treatment, lower sheet resistance, and lower emissivity. E.g., see paragraphs [0009], [0010], [0018], [0030], [0031] and [0046] of the instant specification. In order to stress these unexpected results, claim 15 further requires that when measured monolithically following heat treatment the coated article has a visible transmission of at



least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E_n$ ) of less than or equal to about 0.04 (e.g., see ¶¶ 17-19, 30, 36, 44).

*Claim 30*

The invention of the claim 30 relates to a coated article (e.g., ¶ 20). The coated article comprises a first dielectric layer comprising silicon nitride (e.g., see 3 in Fig. 1; ¶¶ 21, 23, 29); a first layer comprising zinc oxide (e.g., see 7 in Fig. 1); a first infrared (IR) reflecting layer (e.g., see 9 in Fig. 1; ¶¶ 21, 26); at least one dielectric layer comprising at least one of tin oxide and silicon nitride (e.g., see 13 and/or 14 in Fig. 1); a second layer comprising zinc oxide (e.g., see 17 in Fig. 1); a second IR reflecting layer (e.g., see 19 in Fig. 1; ¶¶ 21, 26); a layer consisting essentially of an oxide of Ni and/or Cr (e.g., see 21 in Fig. 1; ¶¶ 17, 18, 21, 27); a third layer comprising zinc oxide contacting the layer consisting essentially of the oxide of Ni and/or Cr (e.g., see 22 in Fig. 1; ¶¶ 17, 18, 21, 29); another dielectric layer located over at least the third layer comprising zinc oxide (e.g., see 23 and/or 25 in Fig. 1; ¶¶ 21). In order to stress these unexpected results, claim 30 further requires that when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E_n$ ) of less than or equal to about 0.04 (e.g., see ¶¶ 17-19, 30, 36, 44).

*Claim 32*

The invention of the claim 32 relates to a heat treated coated article (e.g., ¶ 20). The coated article comprises a dielectric layer comprising silicon nitride (e.g., see 3 in Fig. 1; ¶¶ 21); a first contact layer (e.g., see 7 in Fig. 1; ¶¶ 29); a first infrared (IR) reflecting layer comprising silver (e.g., see 9 in Fig. 1; ¶¶ 21, 26); at least one dielectric

layer comprising at least one of tin oxide and silicon nitride (e.g., see 13 and/or 14 in Fig. 1); a second contact layer (e.g., see 17 in Fig. 1; ¶¶ 21, 29); a second IR reflecting layer comprising silver (e.g., see 19 in Fig. 1; ¶¶ 21, 26); a layer consisting essentially of an oxide of NiCr (e.g., see 21 in Fig. 1; ¶¶ 17, 18, 21, 27); a layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of NiCr (e.g., see 22 in Fig. 1; ¶¶ 17, 18, 21, 29); another dielectric layer comprising silicon nitride (e.g., see 25 in Fig. 1). The instant specification explains that the use of a layer comprising zinc oxide located over and contacting the oxide of NiCr (which is over and contacting an IR reflecting layer) unexpectedly and surprisingly results in higher visible transmission, improved thermal stability upon heat treatment, lower sheet resistance, and lower emissivity. E.g., see paragraphs [0009], [0010], [0018], [0030], [0031] and [0046] of the instant specification. In order to stress these unexpected results, claim 32 further requires that when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E_n$ ) of less than or equal to about 0.04 (e.g., see ¶¶ 17-19, 30, 36, 44).

**(VI) GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

A. Whether claims 1, 4-7, 11-15, 18-22, 26, 27 and 30-33 are unpatentable under Section 103(a) over Glaser (US 5,837,361) in view of Depauw (US 5,153,054).

B. Whether claims 1, 4-5, 11-15, 18-20, 26, 27 and 30-33 are unpatentable under Section 103(a) over Hartig (US 5,557,462) in view of Depauw (US 5,153,054).

C. Whether claims 6-7 and 21-22 are unpatentable under Section 103(a) over Hartig in view of Depauw as applied to claim 1, and further in view of Koch (US 5,718,980).

D. Whether claims 1, 4-5, 11, 15, 18-20, 26, 30 and 32 are unpatentable under Section 103(a) over Lemmer (US 6,336,999) in view of Depauw (US 5,153,054).

E. Whether claims 6-7 and 21-22 are unpatentable under Section 103(a) over Lemmer in view of Depauw as applied to claim 1, and further in view of Koch (US 5,718,980).

(VII) ARGUMENT

It is axiomatic that in order for a reference to anticipate a claim, it must disclose, teach or suggest each and every feature recited in the claim. See, e.g., Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983). The USPTO has the burden in this respect.

Moreover, the USPTO has the burden under 35 U.S.C. Section 103 of establishing a *prima facie* case of obviousness. In re Piasecki, 745, F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). It can satisfy this burden only by showing that some objective teaching in the prior art, or that knowledge generally available to one of ordinary skill in the art, would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Before the USPTO may combine the disclosures of the references in order to establish a *prima facie* case of obviousness, there must be some suggestion for doing so. In re Jones, 958 F.2d 347 (Fed. Cir. 1992). Even assuming, *arguendo*, that a given combination of references is proper, the combination of references must in any event disclose the features of the claimed invention in order to render it obvious.

Furthermore, with respect to the inherency rejections, the law is clear that for something to be “inherent” in a reference, it must “necessarily” be present. *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). The fact that a certain result or characteristic “may” occur or be present in the prior art is not sufficient to establish the inherence of that result of characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). The Board of Appeals has made clear

that “[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

**A. Section 103(a) Rejections Based On Glaser in view of Depauw**

**Claim 1**

Claim 1 stands rejected under Section 103(a) as being allegedly unpatentable over Glaser (US 5,837,361) in view of Depauw (US 5,153,054). This Section 103(a) rejection should be reversed for at least the following reasons.

Claim 1 requires a second layer comprising *zinc oxide located over and contacting the layer consisting essentially of an oxide of NiCr*. E.g., see second zinc oxide layer 22 in Fig. 1 provided over and contacting NiCrOx layer 21. For example, the instant specification explains that the use of a layer comprising zinc oxide located over and contacting the oxide of NiCr (which is over and contacting an IR reflecting layer) unexpectedly and surprisingly results in higher visible transmission, improved thermal stability upon heat treatment, lower sheet resistance, and lower emissivity. E.g., see paragraphs [0009], [0010], [0018], [0030], [0031] and [0046] of the instant specification.

In order to stress these unexpected results, claim 1 further requires that “when measured monolithically following heat treatment the coated article has a *visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E_n$ ) of less than or equal to about 0.04.*”

The cited art fails to disclose or suggest the above features required by claim 1.

Glaser merely discloses, from the glass substrate outwardly, a layer stack portion of Ag/NiCr/SnO<sub>2</sub>/Bi<sub>2</sub>O<sub>3</sub>. Thus, Glaser fails to disclose or suggest a second layer comprising zinc oxide located over and contacting a layer consisting essentially of the oxide of NiCr as recited in claim 1. Furthermore, Glaser also fails to disclose or suggest heat treatment, let alone a heat treated coated article that can achieve a desirable combination following heat treatment of the combination of visible transmission of at least 80%, sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E_n$ ) of less than or equal to about 0.04 as recited in claim 1. Glaser teaches directly away from the invention of claim 1 in this regard, because Glaser's single silver coating only has a visible transmission of 77% - much less than that required by claim 1 (note: single silver coatings such as Examples 1-2 of Glaser typically have a transmission much higher than do like double silver coatings due to the additional light-absorbing layer(s) used in double silver coatings, thus further emphasizing that Glaser teaches away from claim 1). Moreover, the Examiner's contention that the above features are inherent is not well taken given that Glaser expressly states to the contrary.

Citation to Depauw cannot cure the aforesaid fundamental flaws of Glaser, for at least the following three reasons.

First, Depauw teaches to provide "zinc oxide above the sacrificial metal layer" of titanium metal, aluminum metal, stainless steel metal, bismuth metal or tin metal (e.g., col. 4, lines 8-10; col. 3, lines 28-32; col. 5, lines 31-36). However, there is no suggestion or disclosure of providing such a layer comprising zinc oxide over a NiCrOx layer as required by claim 1. There is nothing in the cited art which hints at providing a

layer comprising zinc oxide over NiCrOx as required by claim 1. Hindsight is not permissible.

Second, the Office Action contends that it would have been obvious to have placed a zinc oxide layer above each of the sacrificial metal layers in Glaser. However, even if these were done (which applicant does not believe would have been obvious), the invention of claim 1 still would not be met. This is because claim 1 requires a heat treated coated article that can achieve a desirable combination following heat treatment of the combination of visible transmission of at least 80%, sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E_n$ ) of less than or equal to about 0.04. Both Glaser and Depauw fail to disclose or suggest this. For instance, as explained above, Glaser's single silver coating only has a visible transmission of 77% - much less than the "at least 80%" required by claim 1. Moreover, given that single silver coatings such as Examples 1-2 of Glaser typically have a transmission much *higher* than do like double silver coatings (claim 1 requires two IR reflecting layers) due to the additional light-absorbing layer(s) used in double silver coatings – adding another IR reflecting layer to Glaser as called for in claim 1 would actually *decrease* the transmission thereby causing the modified reference to move even further away from the "at least 80%" requirement of claim 1. Depauw also cannot achieve these features; Depauw's emissivity of 0.08 is well above that called for in claim 1 – its sheet resistance would also be well outside of the claimed range. Thus, even the alleged combination would not meet the invention of claim 1 for at least the above reasons.

Third, while applicant disagrees that there is any *prima facie* case of obviousness, the unexpected results associated with the invention of claim 1 rebut any possible *prima*

*facie* case of obviousness. For example, the instant specification explains that the use of a layer comprising zinc oxide located over and contacting the layer comprising the oxide of NiCr (which is over and contacting an IR reflecting layer) unexpectedly and surprisingly results in higher visible transmission, improved thermal stability upon heat treatment, lower sheets resistance, and lower emissivity. E.g., see paragraphs [0009], [0010], [0018], [0030], [0031] and [0046] of the instant specification.

Accordingly, it is respectfully submitted that the Section 103(a) rejection of claim 1 based on Glaser and Depauw is flawed for the above reasons and should be reversed.

Claim 11

Claim 11 requires that “when measured monolithically following heat treatment the coated article has a *visible transmission of at least 81%* and a sheet resistance ( $R_s$ ) of less than or equal to 2.1 ohms/square.” As explained above, the Glaser and Depauw fail to disclose or suggest this. Even the alleged combination of Glaser and Depauw fails to disclose or suggest a visible transmission of at least 81% and a sheet resistance of less than or equal to 2.1 ohms/square. The rejection of claim 11 is also flawed and should be reversed.

Claim 15

Claim 15 requires “a layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of Ni and/or Cr . . . . when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity (E) of less than or equal to about 0.04.” As explained above in connection



with claim 1, the cited art fails to disclose or suggest these features of claim 15 – see the three reasons discussed above in connection with claim 1.

Claims 30 and 32

Claims 30 and 32 require (a) zinc oxide contacting the layer consisting essentially of the oxide of Ni and/or Cr, and (b) when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E$ ) of less than or equal to about 0.04. As explained above in connection with claim 1, the cited art fails to disclose or suggest these features of claims 30 and 32 – see the three reasons discussed above in connection with claim 1.

**B. Section 103(a) Rejections Based On Hartig in view of Depauw**

Claim 1

Claim 1 stands rejected under Section 103(a) as being allegedly unpatentable over Hartig (US 5,557,462) in view of Depauw. This Section 103(a) rejection should be reversed for at least the following reasons.

Claim 1 requires a second layer comprising *zinc oxide located over and contacting the layer consisting essentially of an oxide of NiCr*. In order to stress the unexpected results associated with this feature, claim 1 further requires that “when measured monolithically following heat treatment the coated article has a *visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E_n$ ) of less than or equal to about 0.04.*” The cited art fails to disclose or suggest the above features required by claim 1.

Hartig merely discloses, from the glass substrate outwardly, a layer stack portion of Ag/NiCr/Si<sub>3</sub>N<sub>4</sub>. Thus, Hartig fails to disclose or suggest a layer comprising zinc oxide located over and contacting a layer consisting essentially of an oxide of NiCr as recited in claim 1. Furthermore, Hartig also fails to disclose or suggest a coated article that after heat treatment (e.g., thermal tempering) can achieve a visible transmission of at least 80% as required by claim 1. Hartig teaches directly away from the invention of claim 1 in this regard, because Hartig's coated article only has a visible transmission of 76% or less - much less than that required by claim 1 (e.g., see Hartig at col. 15, line 26; col. 15, line 41; and col. 11, line 30). Hartig cannot achieve the visible transmission of at least 80% that is required by claim 1. Moreover, Hartig also does not appear to disclose or suggest the "oxide" of NiCr called for in claim 1 (instead, Hartig teaches a nitride of NiCr at col. 10, lines 36-44). Moreover, the Examiner's contention that the above features are inherent is not well taken given that Hartig expressly states to the contrary.

Citation to Depauw cannot cure the aforesaid fundamental flaws of Hartig, for at least the following three reasons.

First, Depauw teaches to provide "zinc oxide above the sacrificial metal layer" of titanium metal, aluminum metal, stainless steel metal, bismuth metal or tin metal (e.g., col. 4, lines 8-10; col. 3, lines 28-32; col. 5, lines 31-36). However, there is no suggestion or disclosure of providing such a layer comprising zinc oxide over a NiCrOx layer as required by claim 1. There is nothing in the cited art which hints at providing a layer comprising zinc oxide over NiCrOx as required by claim 1. Hindsight is not permissible. Thus, even the alleged combination fails to meet this feature of claim 1.

Second, the Office Action contends that it would have been obvious to have placed a zinc oxide layer above each of the sacrificial metal layers in Hartig. However, even if these were done (which applicant does not believe would have been obvious), the invention of claim 1 still would not be met. This is because claim 1 requires a heat treated coated article that can achieve a desirable combination following heat treatment of the combination of visible transmission of at least 80%, sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E_n$ ) of less than or equal to about 0.04. Both Hartig and Depauw fail to disclose or suggest this. For instance, as explained above, Hartig's coated article can only achieve a visible transmission of 76% or less - much less than that required by claim 1 (e.g., see Hartig at col. 15, line 26; col. 15, line 41; and col. 11, line 30). Again, even the alleged combination fails to meet claim 1.

Third, while applicant disagrees that there is any *prima facie* case of obviousness, the unexpected results associated with the invention of claim 1 rebut any possible *prima facie* case of obviousness. For example, the instant specification explains that the use of a layer comprising zinc oxide located over and contacting the layer comprising the oxide of NiCr (which is over and contacting an IR reflecting layer) unexpectedly and surprisingly results in higher visible transmission, improved thermal stability upon heat treatment, lower sheets resistance, and lower emissivity. E.g., see paragraphs [0009], [0010], [0018], [0030], [0031] and [0046] of the instant specification.

Accordingly, it is respectfully submitted that the Section 103(a) rejection of claim 1 based on Hartig and Depauw is flawed for the above reasons and should be reversed.

Claim 11

Claim 11 requires that “when measured monolithically following heat treatment the coated article has a *visible transmission of at least 81%* and a sheet resistance ( $R_s$ ) of less than or equal to 2.1 ohms/square.” As explained above, the Hartig and Depauw fail to disclose or suggest this. Even the alleged combination of Hartig and Depauw fails to disclose or suggest a visible transmission of at least 81%. The rejection of claim 11 is also flawed and should be reversed.

Claim 15

Claim 15 requires “a layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of Ni and/or Cr . . . when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity (E) of less than or equal to about 0.04.” As explained above in connection with claim 1, the cited art fails to disclose or suggest these features of claim 15 – see the three reasons discussed above in connection with claim 1.

Claims 30 and 32

Claims 30 and 32 require (a) zinc oxide contacting the layer consisting essentially of the oxide of Ni and/or Cr, and (b) when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity (E) of less than or equal to about 0.04. As explained above in connection with claim 1, the cited art fails to disclose or suggest these features of claims 30 and 32 – see the three reasons discussed above in connection with claim 1.

**C. Section 103(a) Rejections Based On Hartig in view of both Depauw and**

**Koch**

Claims 6-7 and 21-22 stand rejected under Section 103(a) over Hartig in view of Depauw as applied to claim 1, and further in view of Koch (US 5,718,980). This Section 103(a) rejection is incorrect for the reasons discussed above in Section B.

Moreover, there is no suggestion or motivation in the cited art to modify Hartig/Depauw as alleged in the Office Action to meet the inventions of claims 6-7 and 21-22.

Claim 6 requires a layer comprising tin oxide located between the first IR reflecting layer and the first layer comprising zinc oxide. Claim 7 requires a layer comprising tin oxide located between the second layer comprising zinc oxide and the another dielectric layer, wherein the layer comprising tin oxide contacts the second layer comprising zinc oxide.” There is no suggestion or motivation in the cited art for modifying Hartig in order to meet these features of claims 6-7. Hindsight has been used and is not permissible.

The rejection of claims 21-22 is flawed in a similar manner.

**D. Section 103(a) Rejections Based On Lemmer in view of Depauw**

**Claim 1**

Claim 1 stands rejected under Section 103(a) as being allegedly unpatentable over Lemmer (US 6,336,999) in view of Depauw. This Section 103(a) rejection should be reversed for at least the following reasons.

Lemmer essentially discloses in Figs. 1-2 the same coating as Hartig discussed above. Thus, the Section 103(a) rejection based on Lemmer/Depauw is incorrect for the

same reasons discussed above regarding the rejection based on Hartig/Depauw. See below.

Claim 1 requires a second layer comprising *zinc oxide located over and contacting the layer consisting essentially of an oxide of NiCr*. In order to stress the unexpected results associated with this feature, claim 1 further requires that “when measured monolithically following heat treatment the coated article has a *visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E_n$ ) of less than or equal to about 0.04.*” The cited art fails to disclose or suggest the above features required by claim 1.

Lemmer merely discloses, from the glass substrate outwardly, a layer stack portion of Ag/NiCr/Si<sub>3</sub>N<sub>4</sub> (see Figs. 1-2 of Lemmer) Thus, Lemmer fails to disclose or suggest a layer comprising zinc oxide located over and contacting a layer consisting essentially of an oxide of NiCr as recited in claim 1. Furthermore, Lemmer also fails to disclose or suggest a coated article that after heat treatment (e.g., thermal tempering) can achieve a visible transmission of at least 80% as required by claim 1. Hartig teaches that coatings such as Lemmer’s can only achieve a visible transmission of 76% or less - much less than that required by claim 1 (e.g., see Hartig at col. 15, line 26; col. 15, line 41; and col. 11, line 30). Thus, Lemmer cannot achieve the visible transmission of at least 80% that is required by claim 1. Moreover, the Examiner’s contention that the above features are inherent is not well taken given that Hartig explains that coatings such as Lemmer’s cannot achieve the transmission required by claim 1.

Citation to Depauw cannot cure the aforesaid fundamental flaws of Lemmer, for at least the following three reasons.

First, Depauw teaches to provide “zinc oxide above the sacrificial metal layer” of titanium metal, aluminum metal, stainless steel metal, bismuth metal or tin metal (e.g., col. 4, lines 8-10; col. 3, lines 28-32; col. 5, lines 31-36). However, there is no suggestion or disclosure of providing such a layer comprising zinc oxide over a NiCrOx layer as required by claim 1. There is nothing in the cited art which hints at providing a layer comprising zinc oxide over NiCrOx as required by claim 1. Hindsight is not permissible. Thus, even the alleged combination fails to meet this feature of claim 1.

Second, the Office Action contends that it would have been obvious to have placed a zinc oxide layer above each of the sacrificial metal layers in Lemmer. However, even if these were done (which applicant does not believe would have been obvious), the invention of claim 1 still would not be met. This is because claim 1 requires a heat treated coated article that can achieve a desirable combination following heat treatment of the combination of visible transmission of at least 80%, sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E_n$ ) of less than or equal to about 0.04. Both Lemmer and Depauw fail to disclose or suggest this. For instance, as mentioned above, Hartig explains that coated articles like Lemmer can only achieve a visible transmission of 76% or less - much less than that required by claim 1 (e.g., see Hartig at col. 15, line 26; col. 15, line 41; and col. 11, line 30). Again, even the alleged combination fails to meet claim 1.

Third, while applicant disagrees that there is any *prima facie* case of obviousness, the unexpected results associated with the invention of claim 1 rebut any possible *prima facie* case of obviousness. For example, the instant specification explains that the use of a layer comprising zinc oxide located over and contacting the layer comprising the oxide

of NiCr (which is over and contacting an IR reflecting layer) unexpectedly and surprisingly results in higher visible transmission, improved thermal stability upon heat treatment, lower sheets resistance, and lower emissivity. E.g., see paragraphs [0009], [0010], [0018], [0030], [0031] and [0046] of the instant specification.

Accordingly, it is respectfully submitted that the Section 103(a) rejection of claim 1 based on Lemmer and Depauw is flawed for the above reasons and should be reversed.

Claim 11

Claim 11 requires that “when measured monolithically following heat treatment the coated article has a *visible transmission of at least 81%* and a sheet resistance ( $R_s$ ) of less than or equal to 2.1 ohms/square.” As explained above, the Lemmer and Depauw fail to disclose or suggest this. Even the alleged combination of Lemmer and Depauw fails to disclose or suggest a visible transmission of at least 81%. The rejection of claim 11 is also flawed and should be reversed.

Claim 15

Claim 15 requires “a layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of Ni and/or Cr . . . . when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity ( $E$ ) of less than or equal to about 0.04.” As explained above in connection with claim 1, the cited art fails to disclose or suggest these features of claim 15 – see the three reasons discussed above in connection with claim 1.

Claims 30 and 32



Claims 30 and 32 require (a) zinc oxide contacting the layer consisting essentially of the oxide of Ni and/or Cr, and (b) when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity (E) of less than or equal to about 0.04. As explained above in connection with claim 1, the cited art fails to disclose or suggest these features of claims 30 and 32 – see the three reasons discussed above in connection with claim 1.

**E. Section 103(a) Rejections Based On Lemmer in view of both Depauw and**

**Koch**

Claims 6-7 and 21-22 stand rejected under Section 103(a) over Lemmer in view of Depauw as applied to claim 1, and further in view of Koch (US 5,718,980). This Section 103(a) rejection is incorrect for the reasons discussed above in Section D.

Moreover, there is no suggestion or motivation in the cited art to modify Lemmer/Depauw as alleged in the Office Action to meet the inventions of claims 6-7 and 21-22.

Claim 6 requires a layer comprising tin oxide located between the first IR reflecting layer and the first layer comprising zinc oxide. Claim 7 requires a layer comprising tin oxide located between the second layer comprising zinc oxide and the another dielectric layer, wherein the layer comprising tin oxide contacts the second layer comprising zinc oxide.” There is no suggestion or motivation in the cited art for modifying Lemmer in order to meet these features of claims 6-7. Hindsight has been used and is not permissible.

The rejection of claims 21-22 is flawed in a similar manner.

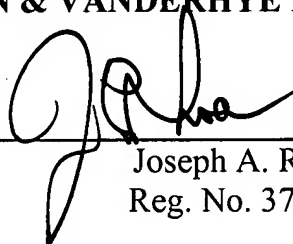
**CONCLUSION**

In conclusion it is believed that the application is in clear condition for allowance; therefore, early reversal of the Final Rejection and passage of the subject application to issue are earnestly solicited.

Respectfully submitted,

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(VIII) CLAIMS APPENDIX

1. A heat treated coated article comprising a coating supported by a glass substrate, the coating comprising:
  - a first dielectric layer;
  - a first infrared (IR) reflecting layer comprising silver located over at least the first dielectric layer;
  - a first layer comprising zinc oxide located over at least the first IR reflecting layer and the first dielectric layer;
  - a second IR reflecting layer comprising silver located over and contacting the first layer comprising zinc oxide;
  - a layer consisting essentially of an oxide of NiCr located over and contacting the second IR reflecting layer;
  - a second layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of NiCr;
  - another dielectric layer located over at least the second layer comprising zinc oxide in the heat treated coated article; and
  - when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity (E) of less than or equal to about 0.04.
2. The coated article of claim 1, wherein at least one of the first and second layers comprising zinc oxide further comprising aluminum.
3. (Canceled)
4. The coated article of claim 1, further comprising another layer comprising zinc oxide located between the first dielectric layer and the first IR reflecting layer, and wherein the first dielectric layer comprises silicon nitride.
5. The coated article of claim 1, wherein the first dielectric layer comprises silicon nitride, and said another dielectric layer also comprises silicon nitride.

6. The coated article of claim 1, further comprising a layer comprising tin oxide located between the first IR reflecting layer and the first layer comprising zinc oxide.

7. The coated article of claim 1, further comprising a layer comprising tin oxide located between the second layer comprising zinc oxide and said another dielectric layer, and wherein the layer comprising tin oxide contacts the second layer comprising zinc oxide.

8. The coated article of claim 1, wherein the first dielectric layer comprises silicon nitride which is Si-rich so as to be represented by  $\text{Si}_x\text{N}_y$ , where  $x/y$  is from 0.8 to 1.4.

9. (Canceled)

10. (Canceled)

11. The coated article of claim 1, wherein when measured monolithically following heat treatment the coated article has a visible transmission of at least 81% and a sheet resistance ( $R_s$ ) of less than or equal to 2.1 ohms/square.

12. The coated article of claim 1, wherein the coated article comprises a laminate including said substrate which supports the coating and is heat treated and that is laminated to another heat treated glass substrate, the laminate having a visible transmission of at least 76% and a sheet resistance ( $R_s$ ) of less than or equal to 3.0 ohms/square.

13. The coated article of claim 1, wherein the coated article comprises a laminate including said substrate which supports the coating and is heat treated and that is laminated to another heat treated glass substrate, the laminate having a visible transmission of at least 77% and a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square.

14. The coated article of claim 1, wherein the coated article comprises a laminate including said substrate which supports the coating and is heat treated and that is laminated to another heat treated glass substrate, the laminate having a visible transmission of at least 78% and a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square.

15. A thermally tempered coated article comprising a coating supported by a glass substrate, the coating comprising:
- a first dielectric layer;
  - a first infrared (IR) reflecting layer comprising silver located over at least the first dielectric layer;
  - a second dielectric layer located over at least the first IR reflecting layer;
  - a second IR reflecting layer comprising silver located over at least the second dielectric layer and the first IR reflecting layer;
  - a layer consisting essentially of an oxide of Ni and/or Cr located over and contacting the second IR reflecting layer;
  - a layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of Ni and/or Cr;
  - another dielectric layer located over at least the layer comprising zinc oxide in the thermally tempered coated article; and
- when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity (E) of less than or equal to about 0.04.
16. The coated article of claim 15, wherein the layer comprising zinc oxide further comprises aluminum.
17. (Canceled)
18. The coated article of claim 15, further comprising another layer comprising zinc oxide located directly under and contacting the second IR reflecting layer.
19. The coated article of claim 15, wherein the first dielectric layer comprises silicon nitride.
20. The coated article of claim 15, wherein the first dielectric layer comprises silicon nitride, said second dielectric layer comprises silicon nitride, and said another dielectric layer comprises silicon nitride.

21. The coated article of claim 15, further comprising a layer comprising tin oxide located between the first IR reflecting layer and the second IR reflecting layer.

22. The coated article of claim 15, further comprising a layer comprising tin oxide located between the layer comprising zinc oxide and said another dielectric layer, and wherein the layer comprising tin oxide contacts the layer comprising zinc oxide.

23. The coated article of claim 15, wherein the first dielectric layer comprises silicon nitride which is Si-rich so as to be represented by  $\text{Si}_x\text{N}_y$ , where  $x/y$  is from 0.8 to 1.4.

24. (Canceled)

25. (Canceled)

26. The coated article of claim 15, wherein the coated article comprises a heat treated substrate which supports the coating, and when measured monolithically following heat treatment the coated article has a visible transmission of at least 81% and a sheet resistance ( $R_s$ ) of less than or equal to 2.1 ohms/square.

27. The coated article of claim 15, wherein the coated article comprises a laminate including said substrate which supports the coating and that is laminated to another heat treated glass substrate.

28. (Canceled)

29. (Canceled)

30. A coated article including a heat treated glass substrate which supports a coating, the coating comprising from the heat treated glass substrate outwardly at least the following layers:

a dielectric layer comprising silicon nitride;

a first layer comprising zinc oxide;

a first IR reflecting layer contacting the first layer comprising zinc oxide;

at least one dielectric layer comprising at least one of tin oxide and silicon nitride;  
a second layer comprising zinc oxide;  
a second IR reflecting layer contacting the second layer comprising zinc oxide;  
a layer consisting essentially of an oxide of Ni and/or Cr;  
a third layer comprising zinc oxide contacting the layer consisting essentially of the oxide of Ni and/or Cr; and  
another dielectric layer located over at least the third layer comprising zinc oxide;  
and

when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity (E) of less than or equal to about 0.04.

31. The coated article of claim 30, wherein the coated article comprises a laminate including said glass substrate which supports the coating being laminated to another heat treated glass substrate to form the laminate, said laminate having a visible transmission of at least 78% and a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square.

32. A heat treated coated article including a glass substrate which supports a coating, the coating comprising from the glass substrate outwardly at least the following layers:

a dielectric layer comprising silicon nitride;  
a first contact layer;  
a first IR reflecting layer comprising silver contacting the first contact layer;  
at least one dielectric layer comprising at least one of tin oxide and silicon nitride;  
a second contact layer;  
a second IR reflecting layer comprising silver contacting the second contact layer;  
a layer consisting essentially of an oxide of NiCr;  
a layer comprising zinc oxide contacting the layer consisting essentially of the oxide of NiCr;

another dielectric layer comprising silicon nitride located over at least the layer comprising zinc oxide in the heat treated coated article; and

when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square, and a normal emissivity (E) of less than or equal to about 0.04.

33. The coated article of claim 32, wherein the coated article comprises a laminate including said glass substrate which supports the coating being laminated to another heat treated glass substrate to form the laminate, said laminate having a visible transmission of at least 78% and a sheet resistance ( $R_s$ ) of less than or equal to 2.5 ohms/square.

34. (Canceled)



(IX) **EVIDENCE APPENDIX**

None

DIETRICH et al.  
Serial No. 10/797,580

(X) **RELATED PROCEEDINGS APPENDIX**

None